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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/708,860

03/29/2004

Hiroyuki Akatsu

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11/15/2005

INTERNATIONAL BUSINESS MACHINES CORPORATION

DEPT. 18G

BLDG. 300-482

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HOPEWELL JUNCTION, NY 12533

EXAMINER

NGUYEN, DAO H

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/708,860

Applicant(s)

AKATSU ET AL.

Examiner

Dao H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-10 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 0104 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0304</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the communications dated 03/09/2004 through 11/02/2005.

Claims 1-20 are active in this application.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statement (IDS) filed on 03/29/2004. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

Election/Restriction

3. Application's election with traverse to prosecute the invention of Group I, claims 1-10, drawn to a semiconductor device, in the Response to Restriction Requirement filed 11/02/05 is acknowledged.

The traversal is on the ground(s) that see the election paper. This is not found persuasive because the fields of search for method claims, which is classified in class 438, and device claims, which is classified in class 257, are NOT coextensive and the

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determinations of patentability of method and device claims are different, that is process limitations and device limitations are given weight differently in determining the patentability of the claimed inventions. Also, the strategies for doing text searching of the device claims and method claims are different. Thus, separate searches are required.

Moreover, the process as claimed can be used to make other and materially different products; and/or the product as claimed can be formed by different process(es). For example, the product as claimed can be formed by a process wherein the collector layer being completely formed before the intrinsic base layer being formed; and/or the collector being formed without using a dopant in a gas phase.

The requirement is still deemed proper and is therefore made **FINAL**.

Claims 11-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected group there being no allowable generic or linking claim.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

4. Applicant is reminded that a complete reply to this Office Action should include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01. Also, upon the cancellation of claims to a non-elected invention, the

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inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

Drawings

5. The drawings are objected to for the following reasons.

Figures 1-2 are not designated by a legend such as "Prior Art". The Legend is necessary in order to clarify what applicant's invention is (see MPEP § 608.02g).

A proposed drawing correction or corrected drawings are required in reply to the Office Action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. However, formal correction of the noted defect(s) can be deferred until the application is allowed by the examiner (see MPEP § 608.02v).

Specification

6. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim(s) 1, and 3-10 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,798,561 to Sato.

Regarding claim 1, Sato discloses a bipolar transistor, as shown in figs. 3, 5, and 10, comprising :

- a collector layer 3;
- an intrinsic base 12a layer overlying said collector layer 3;
- a low-capacitance region 4&6 laterally adjacent to said collector layer 3 including a dielectric region disposed in an undercut underlying said intrinsic base layer 12a;
- an emitter layer 15&16 overlying said intrinsic base layer 12a; and
- a raised extrinsic base layer 7 overlying said intrinsic base layer 12a.

Regarding claim 3, Sato discloses a bipolar transistor wherein said low-capacitance region includes a solid dielectric region 4&6 contacting said collector layer. See fig. 3.

Regarding claim 4, Sato discloses the bipolar transistor wherein said intrinsic base layer 12a is surrounded by said dielectric region 4&6. See fig. 3.

Regarding claim 5, Sato discloses a bipolar transistor wherein said raised extrinsic base layer 7 is self-aligned to said emitter 16. See figs. 3, 5, 10.

Regarding claim 6, Sato discloses a bipolar transistor wherein said raised extrinsic base layer 7 is spaced from said emitter layer 15&16 by a first spacer 9 having a sidewall wholly in contact with said raised extrinsic base layer 7 and a second spacer 14 overlying said first spacer, said second spacer having a sidewall wholly in contact with said emitter layer 15&16. See figs. 3, 5, 10.

Regarding claim 7, Sato discloses a bipolar transistor wherein said collector layer has a dopant concentration of about 10^{20}cm^{-3} . See col. 8, line 11 to col. 12, line 49.

Regarding claim 8, Sato discloses a bipolar transistor further comprising a subcollector 2a disposed below said collector layer 3, and a trench isolation region 2b surrounding peripheral edges of said subcollector 2a. See figs. 3, 5, and 10.

Regarding claim 9, Sato discloses a bipolar transistor wherein said intrinsic base layer 12a includes a layer of a single-crystal semiconductor material which forms a heterojunction with a material of at least one of said emitter layer and said collector layer. See figs. 3, 5, 10; and col. 6, line 22 to col. 16, line 64.

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Regarding claim 10, Sato discloses a bipolar transistor wherein said single-crystal semiconductor material layer included in said intrinsic base layer includes silicon germanium. See col. 13, line 1 to col. 16, line 64.

Allowable Subject Matter

9. Claim(s) 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior art of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed bipolar transistor comprising (in addition to the other limitations in the claim) a dielectric region including a void underlying the intrinsic base layer.

Conclusion

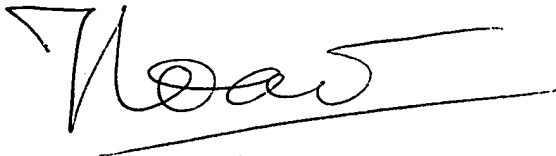
10. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', with a horizontal line underneath.

Dao H. Nguyen
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November 11, 2005

A handwritten signature in black ink, appearing to read 'David Nelms', with a horizontal line underneath.

David Nelms
Supervisory Patent Examiner
Technology Center 2800